



## Natural Heritage & Endangered Species Program

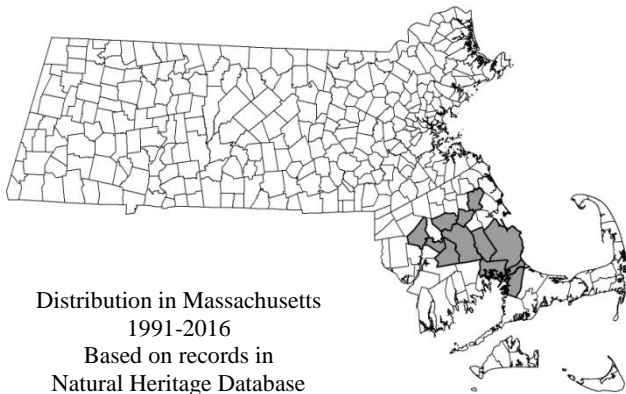
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Massachusetts Division of Fisheries & Wildlife

## Northern Red-bellied Cooter *Pseudemys rubriventris* pop.1

State Status: **Endangered**  
Federal Status: **Endangered**

**DESCRIPTION:** The Northern Red-bellied Cooter (*Pseudemys rubriventris* LeConte, 1830) is a distinctive, large (25 to 34 cm [10 to 13.5 in.]), basking turtle that can weigh up to 5.8 kg (12.7 lbs). The carapace (upper shell) of an adult Red-bellied Cooter is black to brown with faint reddish markings. The plastron (bottom shell) of the males is pale pink with dark mottling, while females have red plastrons with borders of grey along the seams of the shell plates. The color of the head, neck, limbs, and tail is black, with yellow or ivory lines. The upper jaw is notched, and a yellow arrow-shaped stripe runs along the throat and neck. Both sexes may become progressively melanistic (blacken) with age. Some adult males develop a marbled reddish carapace. Males are smaller (average 27.2 cm; max. 30.7 cm), than females (average 29.8 cm; max. 34.3 cm), but have longer tails and longer front claws. Hatchlings are about 2.5 cm (1 in.) in length, and more circular in shape, than adults. They have a slightly keeled, olive or green carapace marked with greenish-yellow hieroglyphics. Like adults, juveniles have yellow stripes on the head, neck, and limbs.



Above: An adult female Northern Red-bellied Cooter from Plymouth, Mass., showing characteristic brownish carapace with red markings.

**SIMILAR SPECIES:** Eastern Painted Turtles (*Chrysemys picta*) are often mistaken for Red-bellied Cooters. Both species have yellow markings on the head and neck and both may have orange plastrons. Red-bellied Cooters lack a pronounced yellow spot behind the eye, have alternated patterned scutes across the back (unlike the Eastern Painted Turtle), can be five times as massive (as adults), and have a carapace that is normally flattened or slightly depressed on top. The Red-bellied Cooter's plastron is coral red or pink, often with dark markings and circular spots along the perimeter, whereas, the Painted Turtle in Plymouth County usually has a solid orange or yellow plastron with no dark markings and a striped perimeter. The Red-Eared Slider (*Trachemys scripta elegans*) is not native to Massachusetts, but has become common in some ponds in the Plymouth area. Sliders may be told from Red-bellied Cooters by the red stripe behind the eye and darker markings on the plastron. Other turtles from the pet trade occasionally show up, including southern species of Cooters and the Yellow-Bellied Slider (*Trachemys scripta scripta*).

**A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan**

## Massachusetts Division of Fisheries & Wildlife

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TOP: A comparative photo of a female (left) and male (right) Northern Red-bellied Cooter from Plymouth, Mass. Note the pinkish red plastron color of the female and the larger overall size. MIDDLE: Some adult males (such as the one pictured here) become melanistic with age, losing their juvenile coloration. BOTTOM: Occasionally, older males will develop a marbled, salmon-colored carapace.

**RANGE:** Massachusetts populations of Northern Red-bellied Cooter comprise an isolated, disjunct population approximately 200 miles from the nearest populations in New Jersey. In Massachusetts, the species is currently confined to ponds and rivers within Plymouth County and eastern Bristol County. Massachusetts populations were formerly described as a distinct subspecies, *P. rubriventris bangsi* (Plymouth Redbelly Turtle). The primary range of the Northern Red-bellied Cooter extends from the Coastal Plain of New Jersey south to the Outer Banks of North Carolina, inland to West Virginia in the Potomac watershed. Archaeological evidence from Massachusetts midden sites indicates that prior to European settlement, Red-bellied Cooters occurred as far north as Ipswich, Essex County, as well as in the Sudbury River and on Martha’s Vineyard.

**HABITAT IN MASSACHUSETTS:** In Massachusetts, the Northern Red-bellied Cooter primarily inhabits freshwater ponds and rivers that have abundant aquatic vegetation and suitable basking sites in the form of logs, rocks, and vegetation mats. Most of the original documented occurrences of Red-bellied Cooters were associated with coastal plain ponds, although they have also been documented in manmade reservoirs and cranberry ponds and introduced to larger lakes and rivers. Red-bellied Cooters nest in exposed sand and gravel, lawns, gardens, and roadsides near ponds and rivers from late May to early July.



Above: Exemplary coastal plain pond habitat of the Northern Red-bellied Cooter in Plymouth, Mass.

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**LIFE CYCLE & BEHAVIOR:** Red-bellied Cooters overwinter at the bottom of ponds and rivers. During the active season, they are found almost exclusively in water. Females will emerge to nest and some individuals each year will move between nearby ponds. Red-bellied Cooters bask on logs, woody debris, rocks, vegetation mats, and manmade rafts throughout the active season.

The Red-bellied Cooter feeds primarily on aquatic vegetation, particularly milfoil (*Myriophyllum* spp.). Especially when young, it may occasionally eat crayfish and invertebrates.

It is known that mating occurs frequently in the spring. From late May to early July, the female begins nesting activity. Red-bellied Cooters have been found nesting on both vegetated and unvegetated areas and in disturbed as well as undisturbed soils. Females typically nest within 91 m (100 yds) of the water's edge. Females dig flask-shaped nests approximately 10 cm (4 in.) deep. In Massachusetts, females typically lay 10-20 eggs and incubation lasts approximately 73 to 80 days. Red-bellied Cooters exhibit temperature-dependent sex determination (TSD); warmer nest site temperatures produce females and cooler sites produce males. Hatchlings emerge from late August through October; overwintering in the nest has been observed very rarely in Plymouth. Hatchling emergence depends more on the conditions of the substrate, temperature patterns, and nest site location than on the timing of egg deposition by the females. Rainfall may also affect emergence. Some hatchlings may overwinter in the nest if the late summer weather is unseasonably cool.

Female Red-bellied Cooters reach maturity at approximately 13 to 20 years of age (later than males). Sexual dimorphism may be apparent at 5 to 7 years. The life expectancy is believed to be more than 50 years.

**THREATS:** Although the Northern Red-bellied Cooter appears to be a pond and riverine generalist across most of its range, it has unique biological needs that make it vulnerable to a variety of environmental changes at the northern edge of its range. Available nesting habitat has probably decreased over the last two decades due to residential construction and changes in certain land use practices, such as fire suppression. In the past, areas adjacent to the ponds burned with some regularity, creating pitch pine/scrub oak barrens dotted with

openings and grasslands. Such openings were good nesting areas, allowing the heat of the sun to penetrate and incubate the eggs. Today, these areas burn infrequently and, as a result, consist more of closed-canopy forests. Residential expansion has also increased population densities of natural predators, collection as pets, water pollution, and road mortality.

In some instances, herbicide use in ponds to decrease pond vegetation and the infiltration of herbicides from adjacent cranberry bogs is believed to have altered the Red-bellied Cooter's food source and exposed it to chemical contamination. These impacts combined with the species' late maturation age and low rate of reproduction (less than one-third of females reproduce yearly) have made it difficult for the Red-bellied Cooter to thrive. Hatchling mortality is very high for this species, with intense predation on the eggs by skunks and raccoons (which increased in population size as residential areas increased) destroying as many as half of the Red-bellied Cooter's existing nests. Bullfrogs, water snakes, wading birds, and predatory fish such as pickerel and bass feed on hatchling turtles.



Above: Note the strongly cusped jaws of this adult female Northern Red-bellied Cooter.

**MANAGEMENT RECOMMENDATIONS:**

Continued inventory and population studies, targeted habitat management, upland habitat conservation, and public outreach and education are vital to the recovery and persistence of the Northern Red-bellied Cooter in Massachusetts.

Management needs include periodic, standardized monitoring of known and potential populations. It is also of primary importance to protect occupied and potential

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habitat, while improving habitat at ponds with known populations by clearing or creating nesting beaches and providing basking sites where necessary.

The Natural Heritage and Endangered Species Program has led a headstarting program for Red-bellied Cooters since 1984. MassWildlife, in cooperation with numerous partners, annually collects about 100 hatchlings each year and raises them in captivity for their first year, producing yearlings that at the time of release are approximately the size of a 3-year-old in the wild. The larger yearlings are significantly less likely to be predated and therefore more likely to make it to adulthood. From 1984 to 2016, more than 4,000 headstarted turtles have been released at more than 30 sites in southeastern Massachusetts. From 2013 to 2016, MassWildlife and the University of Massachusetts Amherst partnered on a study of the effectiveness of the headstart program, finding that annual survivorship rates appear to exceed 95% in many ponds and that reproduction and recruitment in headstarted populations is widespread but locally variable. Research is ongoing to determine the extent and status of the Northern Red-bellied Cooter population in Massachusetts.

**ACTIVE PERIOD**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

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